IN THE SPECIFICATION:

At page 1, immediately after the Title, pleas substitute the following paragraph:

This application is a division of Application No. 09/271,887, filed on March 18, 1999, now U.S. Patent No. 6,661,459.

Please substitute the following paragraph for the paragraph starting at page 2, line 1 and ending at line 6.

However, the CMOS sensor is recently attracting attention, because of the progress in the technology for size reduction of the MOS transistors and the increasing demand for the single-chip integration of the sensor and the signal processing circuit and for the lower electric power consumption.

Please substitute the following paragraph for the paragraph starting at page 3, line 10 and ending at line 24.

Fig. 5 shows the potentials of the channel region in a conventional MOS transistor and the transferring MOS transistor. In Fig. 5, the light enters from the left-hand side, and, on the right-hand side there are formed in succession a transparent insulation layer such as of SiO_2 or SiN, a highly doped p-layer and an n-layer constituting the photodiode. The curve ~~show~~ shows changes in the potential level under the voltage application. In Fig. 5, there are shown an oxide layer 301, Fermi level 302 of the n-layer of the photodiode, Fermi level 303 of a bypass region, a potential 304 under the application of a threshold voltage of the present

invention, and a potential 305 under the application of the threshold voltage of the prior technology.

Please substitute the following paragraph for the paragraph starting at page 9, line 3 and ending at line 5.

Fig. 12 is an equivalent circuit diagram of ~~an~~ a region sensor of the present invention, including a read-out circuit.

Please substitute the following paragraph for the paragraph starting at page 9, line 8 and ending at line 23.

In the following there will be explained a first embodiment of the present invention. Referring to the configuration shown in Fig. 3, there is provided, between the photodiode and the transfer MOS transistor, ~~an~~ a region of a conductive type same as that of the charge accumulation layer. For example, in case of a photodiode consisting of a charge accumulation region formed in a p-well and a surfacially highly doped p-layer formed on the surface of the charge accumulation region, there is provided an n-doped region. Such ~~the~~ region is hereinafter called a bypass region. As a result of providing the bypass region, the electrons in the charge accumulation region move to the floating diffusion region through the bypass region of the low potential and the surface of the transfer MOS transistor, whereby the threshold voltage thereof can be made lower than in the prior art.

Please substitute the following paragraph for the paragraph starting at page 10, line 18 and ending at line 24.

Thus the conditions (1) and (2) respectively determine the lower limit and the upper limit of the impurity concentration and the width of the bypass region. If the impurity concentration of the substrate ~~increase~~ increases as a result of pixel size reduction, the margin of the impurity concentration and the width of the bypass region is inevitably reduced.

Please substitute the following paragraph for the paragraph starting at page 11, line 4 and ending at line 11.

(2) the ~~different~~ difference between the gate voltage of the transfer MOS transistor and the voltage of the drain region thereof (channel region of the vertical CCD shift register) is almost as small as the build-in potential resulting from the difference in the impurity concentration.

Please substitute the following paragraph for the paragraph starting at page 15, line 14 and ending at line 20.

In order to achieve the signal read-out as explained above, it is necessary to satisfy a relation $V_{dep} < V_{sigl}$ by applying an inverse bias to the n-layer of the photodiode, wherein V_{dep} means a voltage at which the entire ~~n-layers~~ n-layer starts to be depleted. The depletion voltage of the photodiode generally means an inverse bias voltage realizing a condition:

Please substitute the following paragraph for the paragraph starting at page 16, line 2 and ending at line 18.

In order to realize the above-described operations, it is necessary to sufficiently turn on the transfer MOS transistor, and, for this purpose, the present invention utilizes the bypass region 106 between the buried photodiode and the transfer MOS transistor. The bypass region need not necessarily be in contact with the semiconductor surface, as shown in Fig. 4. Because, the bypass region need not necessarily be in contact with the semiconductor surface, a shown in Fig. 4. Because, the bypass region is provided between the n-layer of the photodiode and the channel of the transfer MOS transistor, and, being a buried channel, it need not reach the surface. Also, in case the channel is formed at the surface, the bypass region desirably ~~reach~~ reaches the surfacial channel, but, even if it does not reach the surfacial channel, there can be obtained a transfer MOS transistor with a sufficiently lower threshold voltage in comparison with that in the prior art, according to the aforementioned equations.

Please substitute the following paragraph for the paragraph starting at page 19, line 14 and ending at line 19.

In the foregoing, the features of the present invention ~~has~~ have been explained by a configuration of accumulating electrons, but the present invention is likewise applicable to a case of accumulating positive holes and is not limited by the type of the accumulated charge or of the transfer MOS transistor.

Please substitute the following paragraph for the paragraph starting at page 29, line 6 and ending at line 17.

Then oblique ion implantation of phosphor was conducted under 100 keV, utilizing a photoresist layer 1008 and the control electrode 1003 as a mask. The ion implantation angle θ was selected as 10°. Because of such oblique ion implantation, the phosphor was present under the control electrode 1003 even immediately after the ion implantation. In this operation, with respect to the thickness of 400 nm of polycrystalline silicon, the projection stroke and standard deviation phosphor were respectively 120 and 45 nm, whereby the polycrystalline silicon served satisfactorily as a mask (Fig. 8).

Please substitute the following paragraph for the paragraph starting at page 31, line 3 and ending at line 10.

In the following there will be explained, as a ninth embodiment of the present invention, the solid state image pickup device of the embodiment 1 or formed by methods explained in the second to eighth embodiments. The device is ~~an~~ a region sensor having a pixel configuration of Fig. 11 employing the photodiode 705 and the transfer MOS transistor, and also having a read-out circuit shown in Fig. 12.

Please substitute the following paragraph for the paragraph starting at page 33, line 16 and ending at line 20.

fourth and fifth embodiments < third, sixth and seventh embodiments << second embodiment.

This result indicates that the self-aligned formation utilizing the control electrode at a low temperature is more effective.